

AMENDMENTS TO THE SPECIFICATION

Please delete the section entitled "SUMMARY OF THE INVENTION" in its entirety and substitute the following section therefor:

SUMMARY OF THE INVENTION

[0021] The present invention, among other applications, is directed to solving these and other problems and disadvantages of the prior art. The present invention provides a superior technique for performing cryptographic operations within a microprocessor. In one embodiment, an apparatus for performing cryptographic operations is provided. The apparatus has an x86-compatible microprocessor that includes fetch logic, algorithm logic, and execution logic. The fetch logic ~~is disposed within a microprocessor and is~~ configured to receive a cryptographic instruction, wherein the cryptographic instruction is one of the instructions in an application program. The application program is executed by the x86-compatible microprocessor to obtain expected results. The cryptographic instruction prescribes one of the cryptographic operations and one of a plurality of cryptographic algorithms. The algorithm logic ~~is disposed within the microprocessor and~~ operatively coupled to the cryptographic instruction. The algorithm logic directs the x86-compatible microprocessor to execute the one of the cryptographic operations according to the one of a plurality of cryptographic algorithms. The execution logic ~~is disposed within said microprocessor and~~ operatively coupled to the algorithm logic. The execution logic executes the one of the cryptographic operations. The execution logic includes, ~~in addition to an integer unit for executing integer operations prescribed by the application program,~~ a cryptography unit for executing a plurality of cryptographic rounds required to complete the one of the cryptographic operations.

[0022] One aspect of the present invention contemplates an apparatus for performing cryptographic operations. The apparatus has an x86-compatible microprocessor that includes a cryptography unit ~~within a microprocessor and~~ algorithm logic. The cryptography unit executes one of the cryptographic operations responsive to receipt of a cryptographic instruction that prescribes the one of the cryptographic operations, where the cryptographic instruction is one of the instructions in an application program that are

fetched from memory by fetch logic in the x86-compatible microprocessor, and wherein the x86-compatible microprocessor executes the application program to obtain expected results, and wherein the microprocessor includes an integer unit for executing integer operations prescribed by the application program;. The cryptographic instruction has an algorithm field that prescribes one of a plurality of cryptographic algorithms to be employed when executing the one of the cryptographic operations. The algorithm logic is disposed within the microprocessor and operatively coupled to the cryptography unit. The algorithm logic directs the x86-compatible microprocessor to perform the one of the cryptographic operations according to the one of the plurality of cryptographic algorithms.

[0023] Another aspect of the present invention provides a method for performing cryptographic operations in a device. The method includes, ~~within a microprocessor, fetching an integer instruction from memory that prescribes an integer operation, where the integer instruction is part of an application program being executed by the microprocessor;~~ within the microprocessor, fetching a cryptographic instruction from memory for execution by an x86-compatible microprocessor, where the cryptographic instruction that prescribes one of a plurality of cryptographic operations and one of a plurality of cryptographic algorithms; ~~where the cryptographic instruction is also part of the application program being executed by the microprocessor, and wherein the microprocessor executes the application program to obtain expected results; within an integer unit in the microprocessor, executing the integer operation; and within~~and, via a cryptography unit in the x86-compatible microprocessor, executing the one of the cryptographic operations according to the one of the cryptographic algorithms.